**(b)** It checks the FCI mth bit for the NP-SCP dip indication. If the mth bit is not set, then the call flow skips to step 4. If the mth bit is set, but no GAP is included, the call flow skips to step 4. If the mth bit is set and the GAP is included, the MSC uses the value in the GAP parameter as the CdPN.

(4) The MSC now attempts to locate and deliver the call to the mobile using existing call delivery procedures with the following highlights:

    – The Location Request Return Result should include the MSID.

    – The final trunk setup IAM message should ensure that a query is not necessary on a TLDN by setting the FCI query indicator.

    – If the MSC cannot distinguish between TLDN digits and Call Forwarding digits, the MSC, in attempting to route out the call, may activate the WNP trigger and unnecessarily query the NP-SCP. This document recommends that IS-41 provide the means to indicate type of digits so that, at a minimum, the MSC can know to set FCI bit as appropriate so that an unnecessary dip does not occur in the PSTN during final trunk setup.

(5) The mobile station answers the call and the voice path is established.

3.2.2.2 *The Landline-to-Mobile Call with Call Forwarding interaction*

Figure 3-3 illustrates a landline call to a ported mobile subscriber. This call flow, however, depicts the subsequent leg of the call when the call is forwarded, for example, to a voice mail system. Specifically, this call flow illustrates only one example of redirection, Call Forwarding No Answer (CFNA). Text follows the figure for an explanation of each step.

Figure 3-3 Landline to Mobile with CFNA Interaction
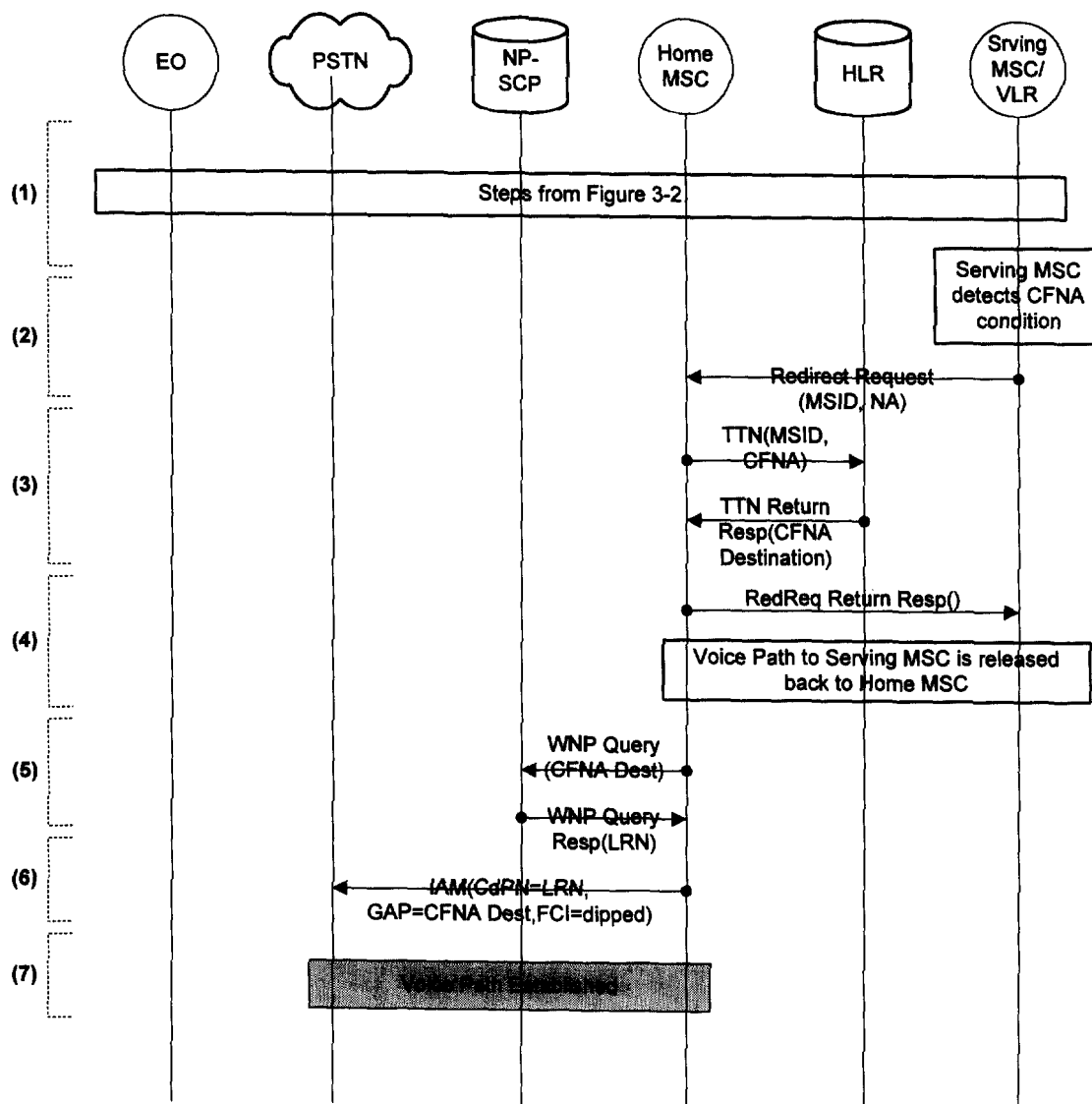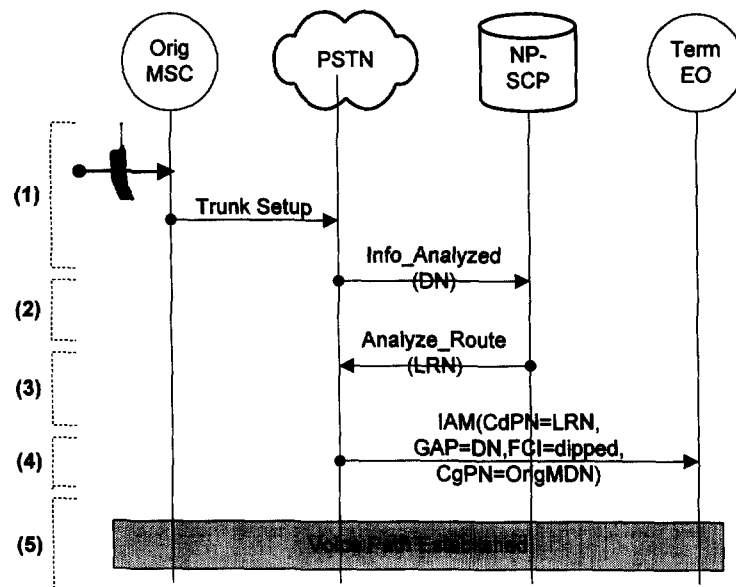

Associated Call Flow Description:

(1) A landline phone originates a call. The processing to establish the voice path to the serving MSC is identical to the call flow in Figure 3-2 and is, therefore, not repeated here.

(2) The Serving MSC detects a No Answer (NA) condition and send a Redirection Request message to the Home MSC indicating the reason (NA) for the redirection request.

(3) The Home MSC sends a Transfer-to-Number Invoke to the subscriber's HLR and forwards the NA indicator. The HLR determines if the subscriber has the CFNA feature authorized and active. If the CFNA feature is authorized and active the HLR sends a Transfer-to-Number return result message back to the Home MSC with the CFNA destination digits included.

(4) The Home MSC sends a Redirection Request Return Result message to the Serving MSC, and the voice connection between the Home MSC and the S-MSC is released.

(5) The CFNA destination digits are analyzed in the Home MSC to determine if a query should be made on the destination digits. The query returns the LRN.

(6) The Home MSC formulates the IAM message with the CdPN equal to the LRN, the GAP equal to the CFNA Destination Digits, and the FCI indicator to dipped.

(7) The call is completed with the new destination.

3.2.2.3 The Mobile-to-Land Call

Figure 3-4 illustrates a mobile to landline call in which the MSC is not the designated querying switch, i.e. a PSTN switch will perform the query. Figure 3-5 also illustrates a mobile to landline call, but in this case the MSC is the designated querying switch.

Figure 3-4 Mobile to Landline - PSTN Performs Query

Associated Call Flow Description:

(1) A mobile places a call, and the Originating MSC passes the call to the PSTN.

(2) The PSTN detects DN is within a portable block and launches a query to the NP-SCP with the landline DN.

(3) The NP-SCP returns the LRN for the DN.

(4) The PSTN formulates and sends the IAM message with the CdPN equal to the LRN, the GAP equal to the DN and the FCI mth bit set as queried to the terminating end office.

(5) The Terminating EO will complete the call to the loop to the assigned to the DN. The call is then connected.

Figure 3-5 Mobile to Landline - MSC Performs Query
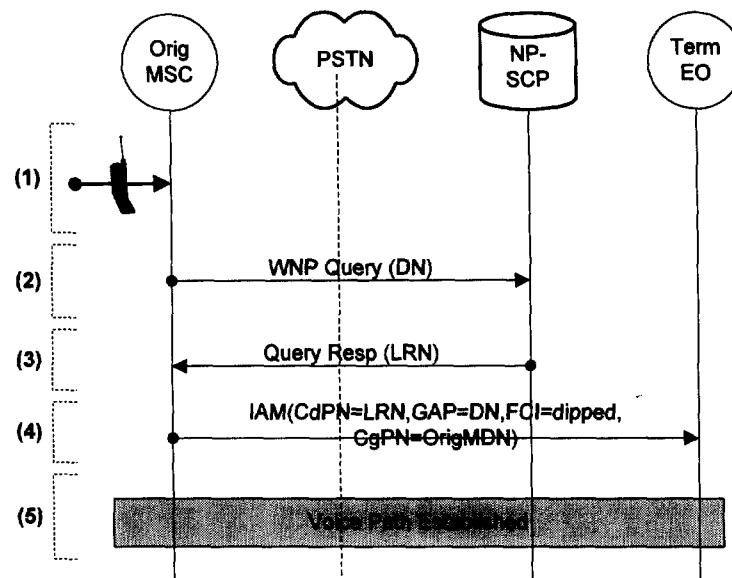
Associated Call Flow Description:

(1) A mobile places a call

(2) The Originating MSC detects DN is within a portable block and launches a query to the NP-SCP with the landline DN.

(3) The NP-SCP returns the LRN for the DN.

(4) The MSC formulates and sends the IAM message with the CdPN equal to the LRN, the GAP equal to the DN and the FCI mth bit set as queried to the terminating end office.

(5) The Terminating EO will complete the call to the called DN.

3.2.2.4 *The Mobile-to-Mobile Call*

Figure 3-6 illustrates a mobile to mobile call in which the MSC is not the designated querying switch, i.e. a PSTN switch will perform the query. Figure 3-7 also illustrates a mobile to mobile call, but in this case the MSC is the designated querying switch. In fact, these figures illustrate that a concatenation of the previous figures (mobile originated and mobile terminated) produce expected results. This is an expected result because the originating and terminating MSCs are unaware of one another.

Therefore, no text is included beyond the figures for the sake of readability. Readers can infer the appropriate descriptions based on the previous call flows.

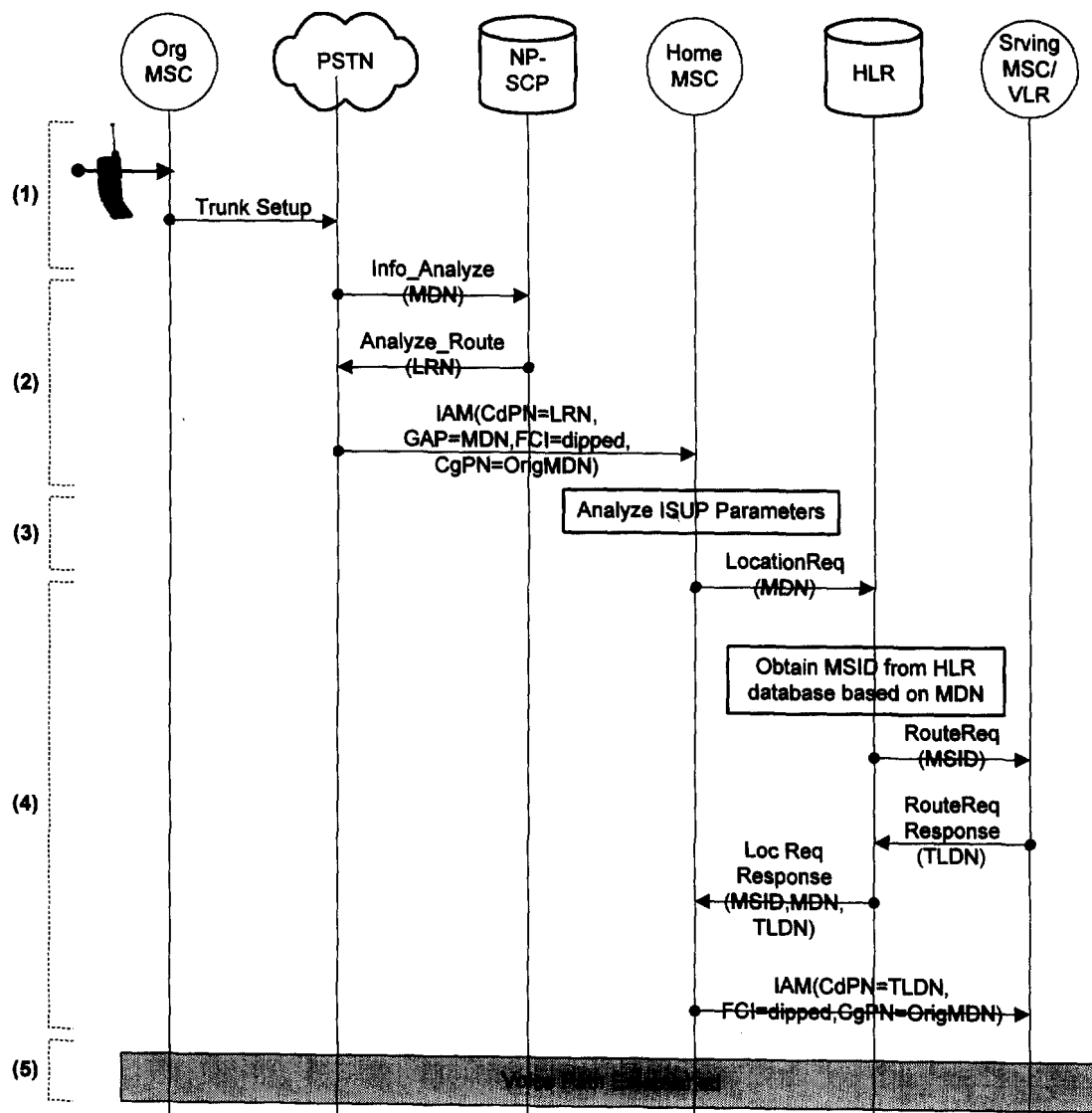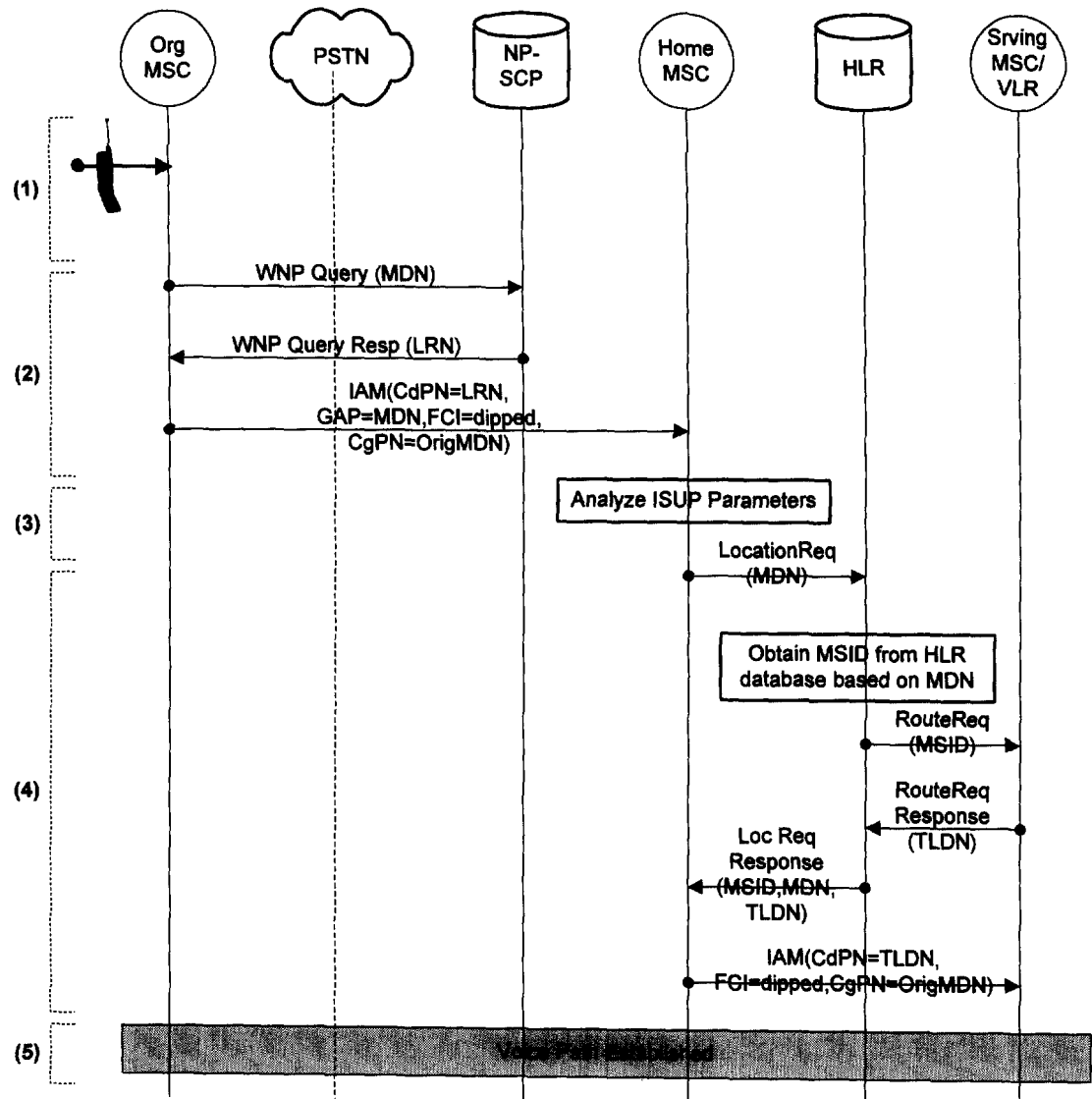## Figure 3-6 Mobile to Mobile - PSTN Performs Query

Figure 3-7 Mobile to Mobile - MSC Performs Query

3.3   Feature Interactions

This section describes the effect of WNP on the current base of wireless services.

3.3.1   Operator Services

An MSC can connect to an operator tandem switch in one of the three following ways:

- via a Type 1 connection to a local telephone company central office switch that interconnects with the operator tandem;

- via a Type 2D connection directly to the operator tandem; or

- via a Type 2A connection to an access tandem that interconnects with an inter-exchange carrier operator tandem using Feature Group D (FGD) signaling.

A mobile station dialing any of the following should route the call directly to the operator tandem where, if necessary, it will perform the query:

- 0-

- 00-

- 10xxx0-

- 101xxxx-0-

- 0-NPA-NXX-XXXX

- 10XXX-0-NPA-NXX-XXXX

- 101XXXX-0-NPA-NXX-XXXX

Existing ANI information transfer and AMA recording at the operator tandem will be sufficient to support WNP. However, the MSC must be modified to forward the MDN and not the MSID as the ANI digits.

3.3.2   Roamer Access Port

The Roamer Access Port service is one of several means of supporting call termination to roamers. Another feature of the Roamer Access Port is to allow the caller to directly be connected to the serving system, eliminating the call segment from the home system to the serving system.

Under the Roamer Access Port services, today, the caller dials a roamer access port number to reach the visited system and enters a roamer's MIN (as an MDN). When the MDN and MSID are separate, the serving system will also need to know the roamer's MSID.

3.3.3 Emergency Services

An MSC can connect to Emergency Services Providers (ESPs) in many ways. The current arrangements typically do not automatically forward the mobile station callback number to the ESP. For such arrangements, the ESP attendant must verbally request the callback number, if desired. FCC rules regarding emergency service calls from wireless systems dictate that by April 1, 1998, an MSC must automatically forward the mobile station callback number along with information identifying the cell site of call origin.

In any proposed configuration, the MDN must be provided to the ESP for callback purposes. The impact on the MSC with the WNP is such that the MSC must be modified to forward the MDN and not the MSID.

To meet the proposed April 1, 1998, FCC requirements, both the MF-FGD signaling and the SS7 ISUP (CPN) signaling arrangements may, in fact, be utilized. Therefore, the MSC must forward the MDN and not the MSID as the FGD ANI digits and must forward the MDN in the CPN parameter of the SS7 ISUP IAM message. This requirement applies to both home mobile stations and roaming mobile stations. Consequently, the MDN must be retrieved from the home system for any registered roaming mobile stations.

The impact of WNP with regard to Emergency Callback whether the call back is over a roamer access port or otherwise requires further study.

3.3.4 Short Message Service

3.3.4.1 Impact of Number Portability

Today, the recipient of a short message is identified by an MDN. The originating network uses the dialed MDN to route the short message to the destination home system. The dialed MDN is the same as the MIN or the first 6 digits of the dialed MDN are the same as the first 6 digits of the MIN if the MDN and MIN are separated. Typically, the first six digits of today's dialed MDN or MIN provide sufficient routing information for the short message to be delivered to the destination home system.

The wireless industry has decided to separate the MSID and the MDN to support WNP. As a result, Short Message Service (SMS) delivery is impacted. SMS will not operate properly as it is currently defined if the destination mobile station has ported its MDN. When the mobile station ports to another service provider, it is assigned a new MSID. The new MSID, particularly the first six digits, will identify the new service provider. However, when a short message is initiated to the ported mobile station, the calling party will only provide the MDN to the network. Since the destination MS has ported, the originating Short Message Entity (SME) or the SS7 network must analyze all the digits of the MDN to derive the necessary routing information to deliver the short message to the destination home system of the ported mobile station.

Five alternatives have been proposed to address the SMS routing problem in the WNP environment. In order to discuss and compare the alternatives, they must each address the following scenarios:

(a) Direct Routing to the Destination Home MC

If the short message need not go through the message originator's home MC, the short message is sent to the destination home MC directly from the originator's serving MSC. The case where a short message is sent from the originator's home MC to the destination home MC is covered under this scenario.

(b) Force Routing through the Message Originator's Home MC

If the SMS Origination Restriction of the originator indicates that the short message must be routed through the originator's home MC, the short message should be sent to the originator's home MC first.

(c) International Roaming

Each alternative must work if the short message is to be sent across the national boundaries (e.g., from the originator's serving MSC in one country to the destination home MC in another country).

Messages routing across national boundaries involves global title translations (GTTs) at the STPs in the national SS7 networks, originating and destination, and at the international gateway STPs in the international domain/level. This section focuses on messages required to be sent across the national boundaries and the translation types that may be required when a particular alternative is discussed.

3.3.4.2 Possible SMS Delivery Alternatives

The alternatives described in this section are to provide the industry with a starting point in addressing SMS impact in a WNP environment. The final solution(s) is for further study.

The descriptions of the alternatives below illustrate the successful delivery of a mobile originated short message to a ported MS. Also, these alternatives assume that the originating system is different from the destination system. Lastly, these alternatives are illustrated using IS-41 messaging protocol as an example.

The call flow procedures described below for each of the five alternatives are for scenario A and in the domestic domain. However, the discussion of the advantages and disadvantages of each alternative will cover scenarios A, B and C.

The following are for clarification in describing the alternatives: [30]

- Short Message Entity (SME) is a functional entity that composes and decomposes short messages. It may be located within and be indistinguishable from an MSC, HLR, VLR, MS, or MC.

- The message center (MC) is an entity that stores and forwards short messages. The MC may also provide supplementary services for SMS.

The following translation types have been identified in the forthcoming alternatives as potentially needed for routing short messages:

- MIN-to-MC translation. This translation type is existing, TT=12.

- IMSI-to-MC translation. This translation type is also existing, TT=13.

- MDN-to-MC translation. This translation type has not yet been defined.

- LRN-to-MC translation. This translation type has not yet been defined.

- MDN-to-NP-SCP translation. This translation type has not yet been defined. This translation type is needed in alternatives 2, 3 and 4 if the short message is to be delivered outside of the NPAC region.

SMS Alternative 1: SMS Forward to Serving Home MC

In alternative 1, an SMS Delivery Point to Point (SMDPP) message is first routed to the donor message center (MC). The donor MC then forwards the short message to the subscriber's home destination MC. The short message is routed to the donor MC by an MDN-to-(donor) MC translation via a 6-digit GTT at the STP or internal lookup table.

The donor MC locates the correct "serving" home MC of a ported subscriber by mapping the dialed MDN to its home MC (i.e., the translation is established via business arrangement). Then, it forwards the message to the serving home MC. The donor MC may be the "original" home MC that serves the MDN before it is ever ported or may be an MC that provides an SMS forwarding service to "original" home systems that do not support SMS (e.g., third party donor MC or wants a third party to perform the forwarding function).

In the situation where the original system is a non-SMS capable system (i.e., had no MC), it is preferable for the third party donor MC to serves all the ported subscribers of the original system (within an NPA-NXX block). This will allow the preservation of 6-digit translation (e.g., 6-digit GTT at the STP) in routing short messages to the donor MC.

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[30] The definitions are from IS-41, TIA/EIA SP 3588.1, Functional Overview, sections 5.1.6 and 5.1.10.

The following illustration along with the call flow procedures describes a successful short message delivery to a ported MS-based SME (i.e., terminating supplementary services):

Figure 3-8 Alternative 1 for SMS Delivery
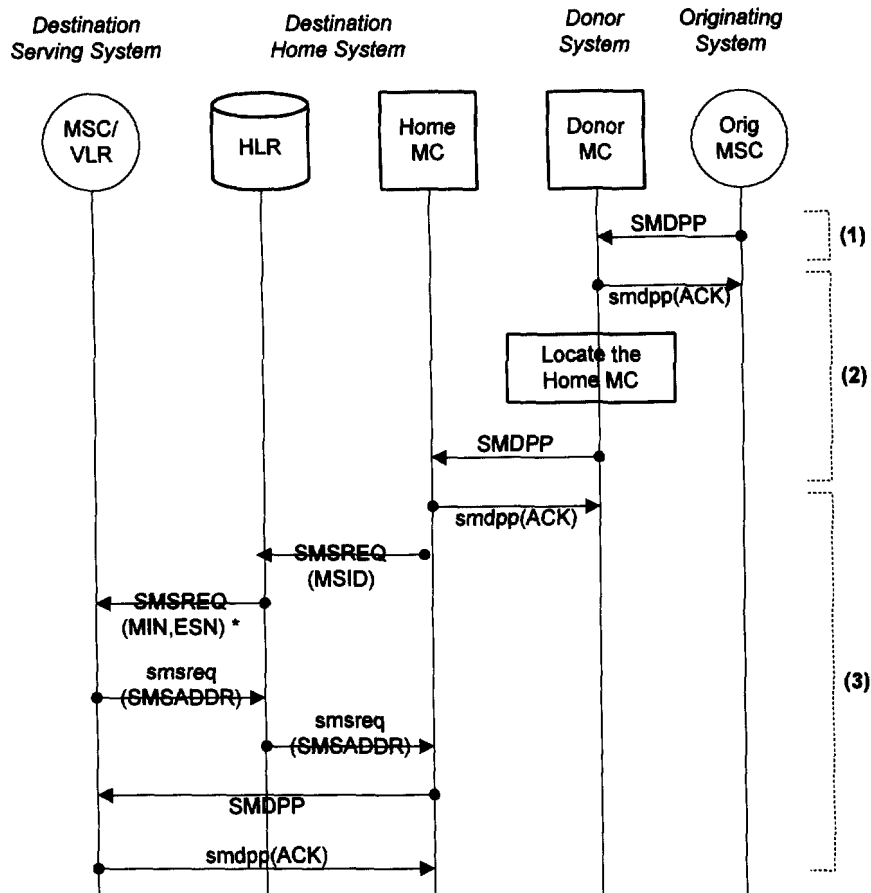
* These messages are sent if the HLR does not have a current temporary SMS routing address

The detailed steps are as follows:

(1) The originating MSC routes the short message to the donor MC by performing an MDN-to-MC translation (i.e., via GTT at the STP or internal table).

If the subscriber has not been ported the donor MC is the subscriber's destination home MC and should existing procedures to deliver the short message.

(2) When the donor home MC receives the SMDPP requesting delivery to a ported MS, it identifies the destination home MC of the ported MS by performing an MDN-to-MC lookup.

In the event that the donor MC is able to forward the SMDPP to the destination home MC or that it is the destination home MC, the donor MC responds to the originating system with an SMDPP positive acknowledgment.

If the MDN has not been ported out, the donor MC (which is the destination home MC) delivers the message using existing procedures. In some instance, it may be more efficient for the donor MC to determine if it is the home MC before it uses the MDN-to-MC lookup table.

In the ported MDN case, the donor MC forwards the short message to the destination home MC.

(3) When the destination home MC receives the SMDPP request, it delivers the short message following existing procedures.

If the donor MC is not able to forward the SMDPP to the destination home system because the donor MC fails to map the MDN to the destination home MC (e.g., there is no business arrangement or the SMDPP was routed to the donor MC in error), the donor MC responds to the originating system with an SMDPP negative acknowledgment with the SMS_CauseCode=1 for address translation failure.

The advantages of Alternative 1 are as follows:

- It uses the 6-digit MDN-to-MC translation to get to the donor MC.
- There is no need to query the NP SCP. This is a cost saving for the carriers if they have to pay for NP SCP queries.
- Wireless carriers may establish reciprocal business arrangement for the donor MC service.
- Short messages for MDNs that are not ported do not need to be forwarded.
- Short messages from other countries will be delivered to the donor MC using the MDN-to-MC translation.
- There is no need for additional translation types. Thus, no need to pay for additional GTTs.

The disadvantages of Alternative 1 are as follows:

- Business arrangements with every donor MC or third party donor MC need to be established to ensure that SMS forwarding will be provided by the donor MC.
- The donor MC needs to maintain an MDN-to-"serving home" MC lookup table. The donor MC needs to be informed by the old service provider to terminate the message

forwarding service and by the new service provider requesting for the donor MC to forward the ported subscriber's messages to the new home MC. The new service provider will have to establish new business arrangement with the donor system while the old provider terminates its arrangement. This is a responsibility that the donor MC assumed because of its business arrangement. Thus, this function should be inherent to the business agreement.

The following items with regard to Alternative 1 should be further investigated:

- Administration of the MDN-to-MC lookup table within the donor MC.

SMS Alternative 2: Message Center Query, LRN response to Originating MC.

In alternative 2, the short message is always sent to the originator's home MC based on the message originator's MSID (i.e., MSID-to-MC GTT at the STP or internal lookup table at the originating SME). When the originator's MC receives the SMDPP, it queries the NP SCP for the LRN associated with the dialed MDN. The short message is routed to the destination home MC using the LRN (i.e., LRN-to-MC GTT at the STP or internal lookup table at the originator's MC).

Figure 3-9 Alternative 2 for WNP SMS Delivery
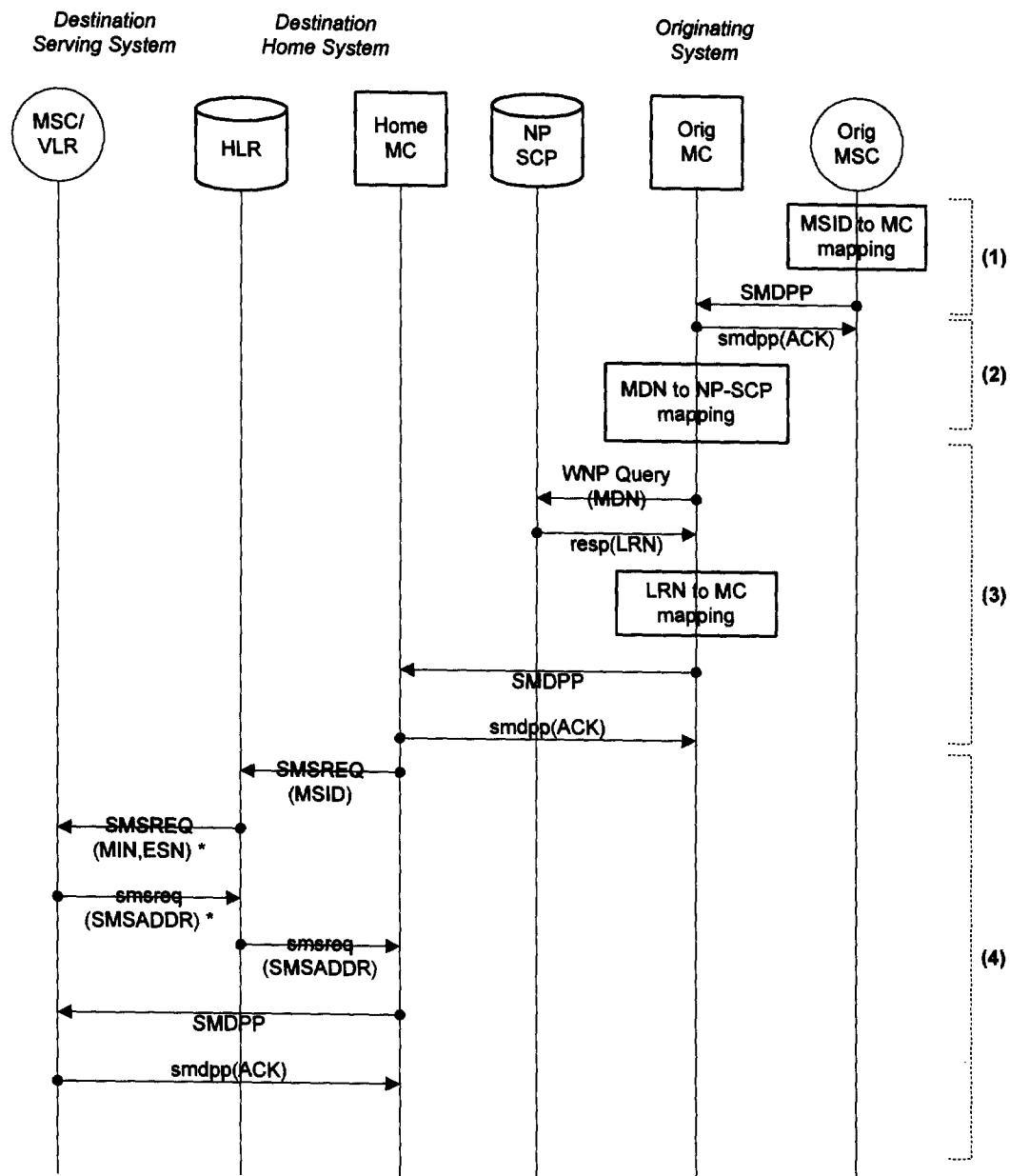
* These messages are sent if the HLR does not hav a current temporary SMS routing address.

The detailed steps are as follows:

(1) The originator's MSC forwards the SMDPP to the originator's home MC using the MSID-to-MC translation via a 6-digit GTT at the STP or internal mapping.

(2) The originator's home MC retrieves the dialed MDN from the SMDPP message. It sends an IS-41 query message to the NP SCP through an STP. The STP performs an MDN-to-NP SCP GTT to identify the appropriated NP-SCP and forward the query message to that NP-SCP.

The NP-SCP maps the MDN to its associated LRN and responds with the LRN to the originator's home MC.

(3) Either an LRN-to-MC GTT translation is done at the STP or, using an internal table in the originator's home MC, the SMDPP message is routed to destination home MC.

(4) The destination home MC delivers the message using existing SMS procedures.

The advantages of Alternative 2 are as follows:

• The existing MSC-NP SCP interface can be used for the MDN-to-LRN translation to support SMS, although it is defined call routing.

• The NP SCP does not need to maintain additional routing information for SMS.

The disadvantages of Alternative 2 are as follows:

• The originator's home MC needs to have IS-41 query capability to query the NP-SCP.

• If multiple MCs serve the same MSC the network needs to support multiple LRNs per MSC or use one of the four digits of LRN for MC.

• New translation types are needed to support the MDN-to-NP SCP GTT (for inter-system) at the STP and the LRN-to-MC GTT at the originator's home MC or STP.

• Administration for the point code of MCs used for the LRN-to-MC GTT will be needed.

The following items with regard to Alternative 2 should be further investigated:

• In order to support international roaming, an originating system (i.e., originator's MC) that is in a foreign country needs to query the NP SCP for an LRN before the SMDPP can be routed to the destination home MC.

• Business arrangements will need to be established with remote NP SCP providers so that queries can be targeted to the appropriate NP SCP with the necessary translation information.

SMS Alternative 3: MSC Query - LRN response to Originating MSC

In alternative 3, the originator's MSC queries the NP SCP for the LRN associated with the dialed MDN. Then, the originator's MSC routes the short message to the destination home MC using the LRN (i.e., LRN-to-MC GTT at the STP or internal lookup table at the originator's MC).

Figure 3-10 Alternative 3 for SMS Delivery
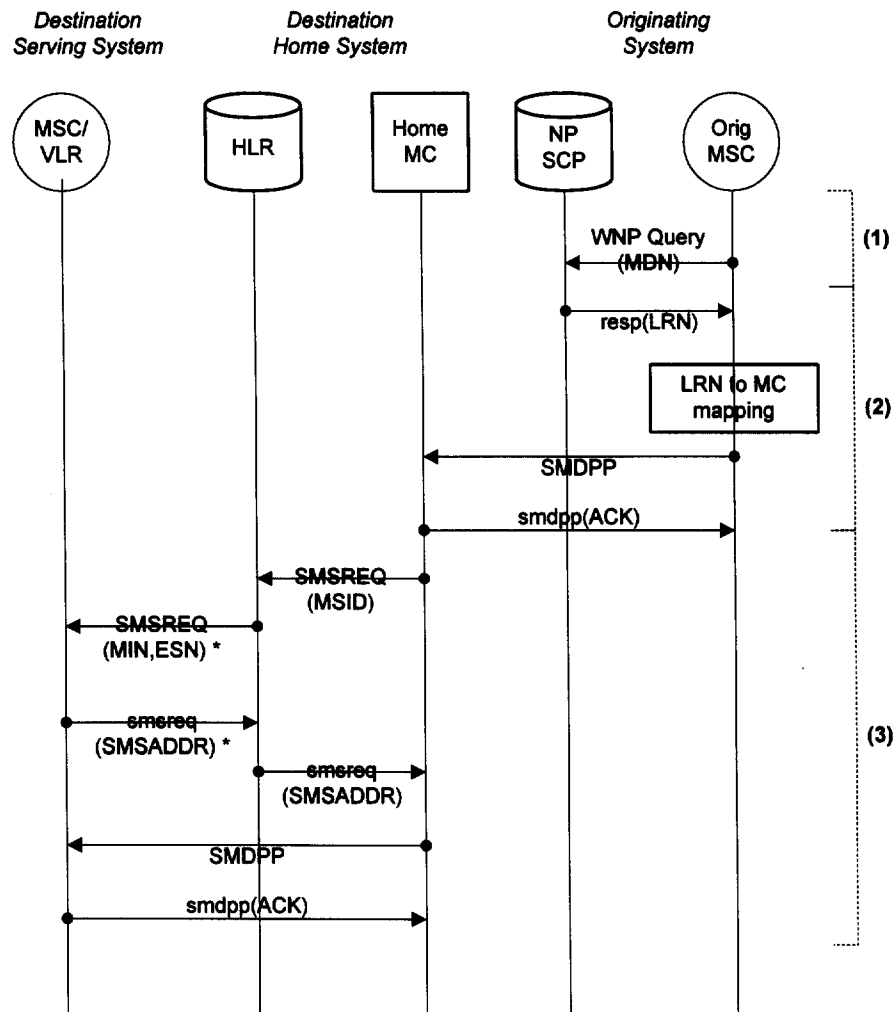
* These messages are sent if the HLR does not hav a current temporary SMS routing address.

The detailed steps are as follows:

(1) The originator's MSC sends an IS-41 query message with the MDN to the NP-SCP through the STP. The STP performs an MDN-to-NP SCP GTT to determine the appropriate NP SCP to forward the query.

The NP-SCP maps the MDN to its associated LRN and responds with the LRN to the originator's MSC.

(2) Either an LRN-to-MC GTT is done at the STP or, using the internal table in the MSC, the SMDPP message is sent to the destination home MC.

(3) The destination home MC delivers the message using existing SMS procedures.

The advantages of Alternative 3 are as follows:

- The existing MSC-NP SCP interface can be used for the MDN-to-LRN translation to support SMS, although it is defined call routing.

- The NP SCP does not need to maintain additional routing information for SMS.

The disadvantages of Alternative 3 are as follows:

- The originator's MSC needs to query the NP-SCP.

- New translation types are needed to support the MDN-to-NP-SCP GTT at the STP and the LRN-to-MC GTT at the MSC or STP.

- Administration for the point code of MCs used for the LRN-to-MC GTT will be needed.

- If force routing is invoked, the originator's MSC, after it receives the LRN from the NP SCP query response, needs to forward the LRN to the MC of the originating system. Enhancement to the IS-41 standard is needed.

- If multiple MCs serve one MSC, the network needs to support multiple LRNs or use one of the four digits of LRN for MC.

The following items with regard to Alternative 3 should be further investigated:

- In order to support international roaming, an originating system (i.e., originator's MSC) that is in a foreign country needs to query the NP SCP for an LRN before the SMDPP can be routed to the destination home MC. This item needs further investigation.

- Business arrangements will need to established with remote NP SCP provider so that queries can be targeted to the appropriate NP SCP with the necessary translation information.

### SMS Alternative 4: MDN-to-MSID Translation at the NP SCP

Alternative 4 requires that the NP SCP contains MDN-to-MSID translations. The MDN-to-MSID translations need to be maintained and administered by the regional NPAC-SMSs. Updates for the translation may use the same method defined for MDN-to-LRN translations.

This scheme requires the originating system to query the NP SCP for an MDN-to-MSID translation. Then, the originating system routes the short message to the destination home system using the MSID provided in the query response.

In the event that the dialed MDN is not within the coverage area of the regional NPAC-SMS, the originating system may have to query an NP SCP that contains the data for the region of the dialed MDN or query an NP SCP that contains nationwide NP data.

The first figure illustrates the call flow for the scenario when the MSC queries the NP SCP for the called party's MSID and the second figure shows the call flow for the MC querying the NP SCP.

Figure 3-11 Alternative 4 for WNP SMS Delivery
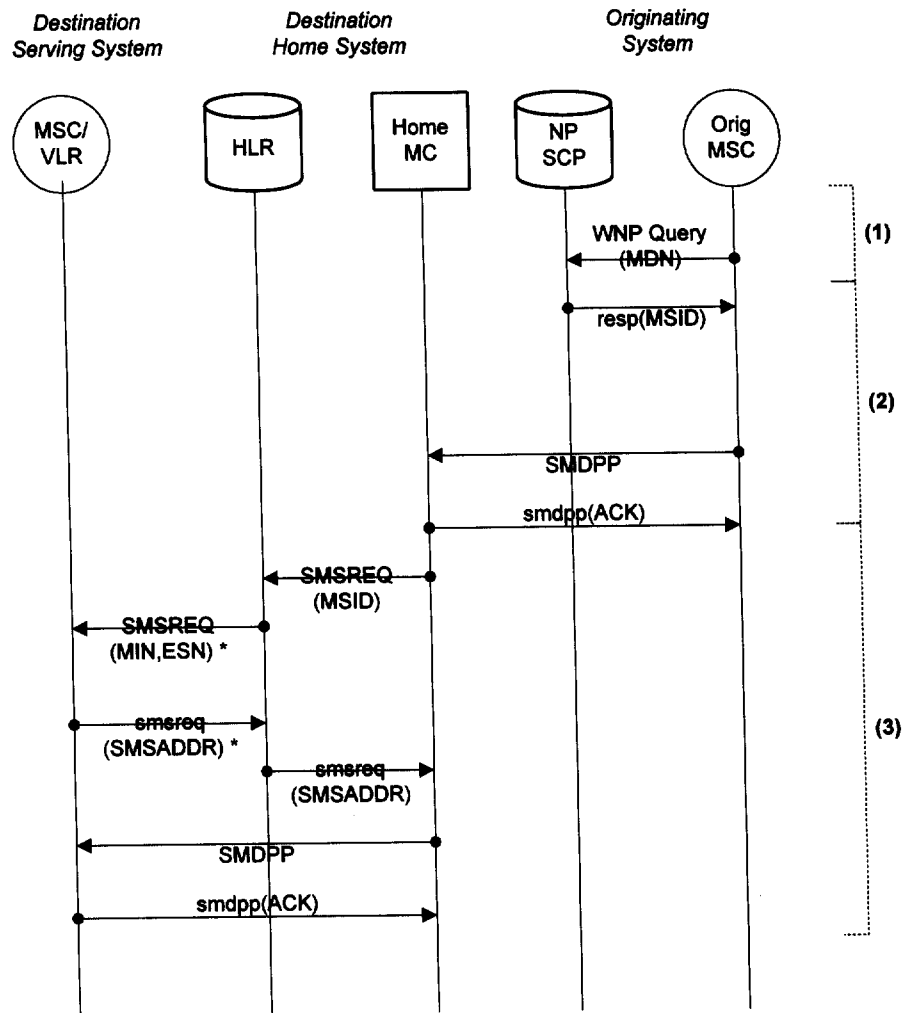
* These messages are sent if the HLR does not hav a current temporary SMS routing address.

The detailed steps are as follows:

(1) The MSC of the originating system queries the NP SCP with the dialed MDN. The NP SCP responds to the query with the MSID associated with the dialed MDN.

(2) The originating system routes the SMDPP message to the destination home MC using the MSID.

(3) When the destination home MC receives the SMDPP request, it delivers the short message following existing procedures.

The advantages of Alternative 4 are as follows:

- The existing MSC-NP SCP interface can be used for the MDN-to-LRN translation to support SMS, although it is defined call routing.

- The MSID-to-MC translation can be used to route short messages to the destination home MC.

The disadvantages of Alternative 4 are as follows:

- NP SCP, local SMS and NPAC-SMS need to support the MDN-to-MSID translations for all wireless subscribers within its region.

- The MSC or the MC need to have the capability to query the NP SCP for an MSID.

- The NP SCP query element needs new protocol.

- Under scenario B where message routing is through the originator's home MC, if the originator's MSC is performing the NP SCP query for an MSID, the originator's MSC needs to forward the MSID to the originator's home MC.

The following items with regard to Alternative 4 should be further investigated:

- Since NPAC-SMSs only contain regional data, it is foreseeable that a query may be launched to an NP SCP that only contain data from the region it is in. Thus, it may be preferable to have the MDN-to-MSID translations for wireless subscribers available nationwide.

- International roaming may require this alternative to have a gateway MSC to launch a query to the NP SCP for the MSID of the called party or may require the foreign country to query the NP SCP.

<u>SMS Alternative 5 - 10-digit GTT at the NP SCP</u>

In alternative 5, the originating MSC or MC routes an SMS Delivery Point to Point (SMDPP) message to called party's home destination MC via a 10-digit GTT at the NP SCP. When the short message arrives at the STP, a 6-digit MDN-to-NP SCP GTT is performed. This may need a new translation type (TT) to forward the message to the NP SCP. Then, the NP SCP maps the MDN to its associated LRN and the incoming translation type to an outgoing translation type for LRN-to-MC translation. The NP SCP relays the short message to the destination MC via a 6-digit LRN-to-MC GTT at an STP.

Figure 3-12 Alternative 5 for SMS Delivery
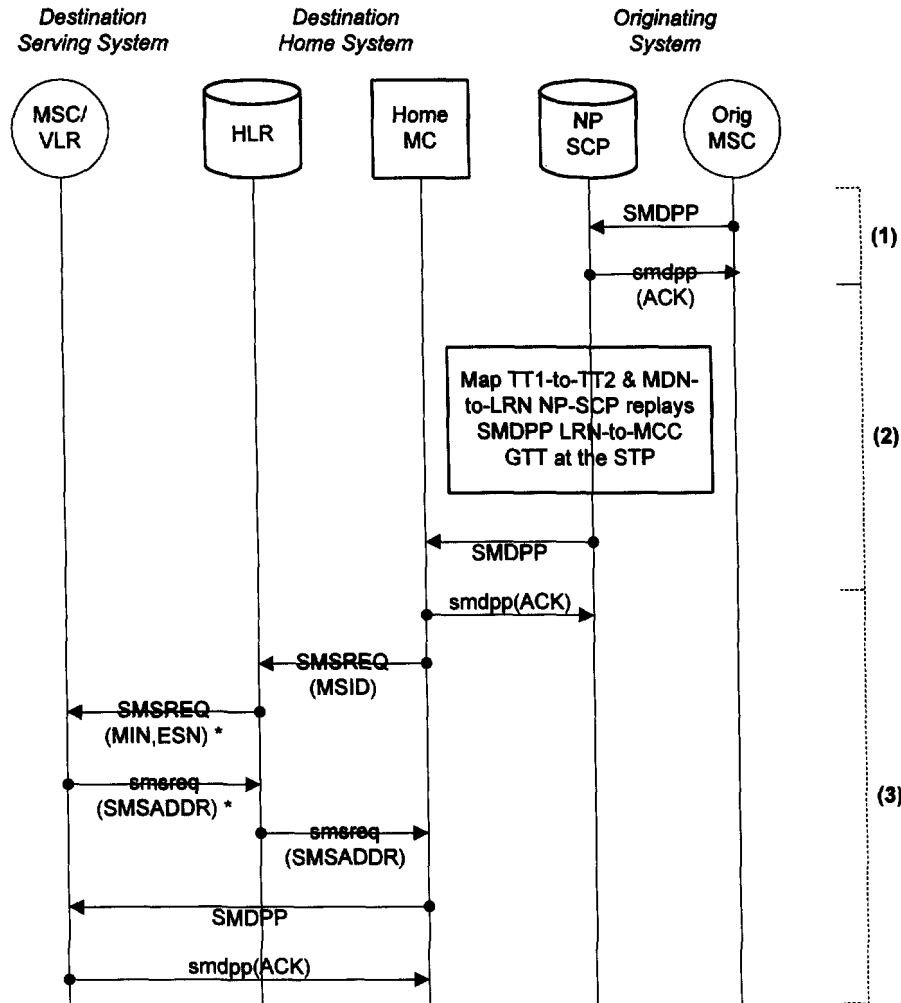
* These messages are sent if the HLR does not hav a current temporary SMS routing address.

The detailed steps are as follows:

(1) The originating MSC or MC routes the SMDPP to the destination MC.

(2) The STP performs a 6-digit MDN-to-NP SCP translation for SMS. When the NP SCP receives the message, it translates the incoming translation type (TT1) to an outgoing translation type (TT2) and maps the MDN to its associated LRN. The NP SCP relays the

short message to the destination MC. Then, the STP performs a 6-digit LRN-to-MC translation to route the message to the destination MC.

(3) When the destination home MC receives the SMDPP request, it delivers the short message following existing procedures.

The advantages of Alternative 5 are as follows:

- Step 2 uses the same 10-digit intermediate GTT at the NP SCP process that the wireline industry is developing/investigating for the support of services such as CLASS, Inter-switch Voice Messaging, Calling Name, and ABS/LIDB.

- The NP SCP does not need to maintain additional routing information for SMS.

- Short messages from other countries will be delivered to the destination home MC using this alternative.

- 10-digit intermediate GTT at the NP SCP is more efficient than querying the NP SCP for the LRN.

The disadvantages of Alternative 5 are as follows:

- The NP SCP needs to the have the capability to perform a 10-digit intermediate GTT at the SCCP level.

- There is a need for two new translation types; one for MDN-to-NP SCP (MC) translation and the other for the LRN-to-MC translation.

- Administration for the point code of MCs used for the LRN-to-MC GTT will be needed.

The following items with regard to Alternative 5 should be further investigated:
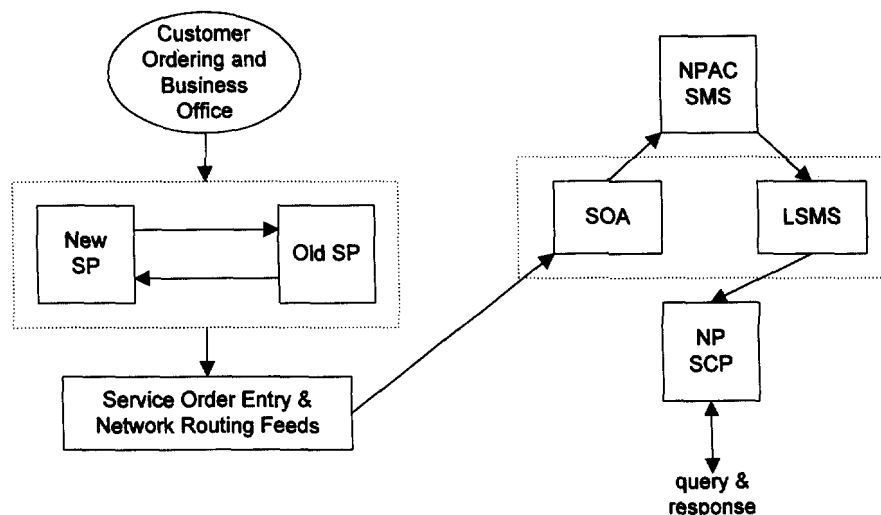
- None identified.

4. BUSINESS SYSTEMS, OPERATION SYSTEMS AND BILLING

4.1 Service Order and Provisioning

4.1.1 Process Flow Overview

Figure 4-1 below illustrates the overall information sharing process for portability.[31]

Figure 4-1   Service Order and Provisioning Process Flow

The NPAC-SMS is an administration center developed, owned and operated by a neutral, third party company (i.e., neutral to all telecommunications service providers). It collects and disseminates information that maps ported subscribers to service providers in a geographic area. Presently, seven geographic areas have been agreed upon[32] for covering the United States, with areas roughly corresponding to the state boundaries associated with the seven Regional Bell Operating Companies (RBOC).

The LSMS is logical Operations Systems (OS) function that accepts downloads from the NPAC-SMS and disseminates the data to the NP-SCPs. This logical function could be a stand-alone system on the WSP premise, an application within another OS, or function provided by another company. A WSP can deploy a single LSMS, LSMSs per NPAC-SMS or LSMSs per NP-SCP;

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[31] *North American Numbering Council LNP Architecture and Administrative Plan*, Issue 5, March 4, 1997.

[32] ibid.

this deployment will depend upon the WSPs infrastructure, NP-SCP platform deployment, and network coverage area.

The Service Order Activation (SOA) function is similar to the LSMS in that it is a function which ties the NPAC-SMS with the WSPs service order processing systems. As with the LSMS, this function could be a physically separate system or a function within another system.

The interface between the NPAC-SMS and the LSMS is an open interface based upon the Common Management Information Protocol (CMIP). This interface, including the CMIP objects, is currently documented in various locations, mostly on a state or regional basis; and the objects can vary among the NPAC-SMSs. However, the NANC NP Working Group is presently looking into creating a single interface document for all of the regions.

The interface between the NPAC-SMS and the SOA is also a CMIP-based interface and similarly documented.

The interface between the LSMS and the NP-SCP as well as the between the SOA and the WSP's Service Order Entry systems is at the discretion of the WSP.

The processes by which these systems communicate information is discussed below.

4.1.2 *Provisioning a Number Block Open for Portability*

Once a number block opens for portability, every telecommunications provider within the region serving that block must provision the block as open within its switches. More specifically, a WSP must populate the appropriate number portability tables in the MSC with the open NPA-NXX so that the NP trigger will trigger the query upon detecting that a called party number's NPA-NXX matches this open NPA-NXX. All open blocks served within the region must be provisioned in the MSC. The determination of how many or few open blocks are provisioned in a single MSC is at the discretion of the WSP depending upon the architecture deployed by the WSP balanced with the responsibility of supporting WNP per the FCC order and this document.

The source for open number blocks will be the LERG. The means for notification is still to be determined. The format of the information will be in NPA-NXX blocks.

4.1.3 *Notifying the Receipt of a Ported Subscriber*

The process of notifying the receipt of a port subscriber involves (a) notifying the NPAC-SMS of the new LRN for the DN so that it can broadcast the new LRN to all SPs within the region, and (b) coordinating the change with the old SP (e.g., service activation, line side provisioning).

A standard process definition is currently being worked by the NANC NP Working Group based upon efforts by various states in defining the flow. This document will not attempt to describe the details of these flows and urges WSPs to review and comment on the work in progress.